

GRADUATE CLIMATE CONFERENCE
Applicant Information Sheet

Name: Jennifer Kay

Mailing Address:

Earth and Space Sciences
University of Washington, Box 351310
Seattle, WA 98195-1310

Birthdate: May 2, 1977

Gender: Female

E-mail Address: jenkay@u.washington.edu

Institution: University of Washington

Year of matriculation: 2000

Department: Earth and Space Sciences

Co-advisors: Marcia Baker, Dean Hegg

Degree goal: Ph.D. (anticipated completion September 2006)

Field of study: Snow and ice in the atmosphere and on the land surface

Undergraduate major: Geology, Economics

If you have multiple graduate degrees, please note here:

M.S., Earth and Space Sciences, University of Washington, 2002

Please list the titles of any recent publications, posters, or conference presentations:

List of my publications and conference presentations (from the last year only):

Kay, J. E., Baker, M., and D. Hegg, Microphysical and dynamical controls on cirrus cloud optical depth distributions, submitted Fall 2005 to *Journal of Geophysical Research- Atmospheres*.

Kay, J. E., Kampf, S. K., Handcock, R., Cherkauer, K., Gillespie, A. R., and S. J. Burges, (2005). Accuracy of lake and stream temperatures estimated from thermal infrared images, *Journal of the American Water Resources Association*, 41 (5), 1161-1175.

Kay, J. E., Tsemekhman, V., Larsen, B., Baker, M. and B. Swanson, (2003). Comment on evidence for surface initiated homogeneous nucleation, *Atmospheric Chemistry and Physics*, 3, 1439-1443.

Kay, J. E., Gillespie, A. R., Hansen, G. B., and E. Pettit, (2003). Spatial relationships between snow contaminant content, grain size, and surface temperature from multi-spectral images of Mt. Rainier, Washington (USA), *Remote Sensing of Environment*, 86:2, 216-231.

Casola, J.H., **Kay, J.E.,** Snover, A.K., Norheim, R.A., Whitely Binder, L. C., and the Climate Impacts Group. (2005). Climate Impacts on Washington's Hydropower, Water Supply, Forests, Fish, and Agriculture. A report prepared for King County (Washington) by the Climate Impacts Group (Center for Science in the Earth System, Joint Institute for the Study of the Atmosphere and Ocean, University of Washington).

Kay, J. E., Baker, M. and D. Hegg, What controls cirrus optical depth distributions?, *2005 Fall AGU Meeting*, San Francisco, California, December 5-9, 2005.

Kay, J. E., Baker, M. and D. Hegg, Microphysical and dynamical influences on cirrus optical depths, 2005 ARM Science Meeting, Daytona Beach, Florida, March 14-18, 2005.

Logistics:

Will you be flying to Seattle?

No.

Will you need transportation assistance from:

-Seattle Airport to Conference Center (via UW)?

-UW campus to Conference Center?

I can hopefully carpool with other attendees from Seattle (UW) to the Conference Center. I could drive if needed.

Depending on the volume of abstract submissions, the final hour of the conference may be devoted to concurrent discussions. Please indicate any discussion topics of particular interest to you.

-Role of solar forcing in climate variability and change on yearly to millennial timescales. For example, we could discuss the use of solar cycle to quantify climate sensitivity (K.K. Tung's work) or other topics discussed in January 2005 Sigma Xi article ("Living in Sunny Times".
<http://www.americanscientist.org/template/AssetDetail/assetid/39261>))

-Quantification of causes for changing CO₂ concentrations over the last 250 years (deforestation, industrial emissions, other?) and their role in observed climate change over the last century. For example, I am interested in isotopic tracers that help scientists understand the origins for atmospheric CO₂.

Cirrus Clouds and Climate 101

-Jennifer Kay

Abstract:

Cirrus clouds influence the Earth's global heat budget and therefore, the climate system. In addition to affecting the lateral and vertical transport of upper tropospheric water vapor, cirrus can result in a negative or a positive radiative forcing depending on their height and optical depth. In my presentation, I will review how cirrus cloud radiative impacts change as a function of optical depth and spatial coverage. Next, I will present modeling results that document how microphysical and dynamical processes in the atmosphere affect cirrus evolution and optical properties. To compliment my modeling results, I will describe observed cirrus inhomogeneity and optical depths using lidar observations from Lamont, OK (USA). Finally, I will review the key factors for cirrus cloud parameterization, briefly explain how cirrus clouds are parameterized in four global climate models used for the IPCC reports, and muse about the implications of my research for future improvements in cirrus cloud parameterizations. From my presentation, I hope non-cirrus researchers will understand why cirrus clouds are important, what processes control their evolution, and the current state of cirrus parameterization in weather and climate models.